

What is claimed is:

- 1 1. A solder-coated article comprising:
2 a dielectric core having a largest dimension ranging from 1 to 1000 microns;
3 a solderable metal layer over said core; and
4 a solder layer over said metal layer.
- 1 2. The solder-coated article of claim 1, wherein said core is a ceramic core.
- 1 3. The solder-coated article of claim 1, wherein said core is a glass core.
- 1 4. The solder-coated article of claim 1, wherein said core is a spherical core.
- 1 5. The solder-coated article of claim 4, wherein said core ranges from 25 to 200
2 microns in diameter.
- 1 6. The solder-coated article of claim 1, wherein said solderable metal layer is selected
2 from copper and nickel.
- 1 7. The solder-coated article of claim 1, wherein said solder is selected from (a) a solder
2 comprising lead and tin and (b) a solder comprising lead and indium.
- 1 8. The solder-coated article of claim 7, wherein said solder layer is selected from a
2 63%Sn/37%Pb solder, a 95%Pb/5%Sn solder, and a 50%Pb/50%In solder.
- 1 9. A modified substrate comprising:
2 a substrate;
3 a metalized pad on said substrate; and

1 a bump feature on said metalized pad, said bump feature comprising a dielectric
2 core; a solderable metal layer over said core; and a solder region contacting at least a
3 portion of said solderable metal layer and at least a portion of said metalized pad.

1 10. The modified substrate of claim 9, wherein said substrate is a semiconductor
2 substrate.

1 11. The modified substrate of claim 9, wherein said substrate is a ceramic substrate.

1 12. The modified substrate of claim 9, wherein said substrate is a printed circuit.

1 13. The modified substrate of claim 12, wherein said printed circuit is selected from a
2 printed circuit board and a flexible circuit.

1 14. The modified substrate of claim 9, wherein said core is a ceramic core.

1 15. The modified substrate of claim 9, wherein said core is a glass core.

1 16. A solder bonded assembly comprising:
2 a first substrate comprising a first solder pad;
3 a second substrate comprising a second solder pad;
4 a dielectric core provided with a solderable metal layer and disposed between
5 said first and second solder pads; and
6 a solder region covering at least a portion of each of (a) said first solder pad, (b)
7 said second solder pad and (c) said solderable metal layer.

1 17. The solder bonded assembly of claim 16, wherein said first and second substrates
2 are selected from the group consisting of a semiconductor substrate, a ceramic
3 substrate and a printed circuit.

- 1 18. The solder bonded assembly of claim 16, wherein said first substrate is a
2 semiconductor substrate and said second substrate is a printed circuit.
- 1 19. The solder bonded assembly of claim 16, wherein said core is a ceramic core.
- 1 20. The solder bonded assembly of claim 16, wherein said core is a glass core.
- 1 21. A method of providing a modified substrate comprising:
2 providing a substrate comprising one or more solder pads; and
3 providing one or more bump features on said one or more solder pads, each said
4 bump feature comprising: (a) a dielectric core; (b) a solderable metal layer over said
5 core; and (c) a solder region covering at least a portion of said solderable metal layer
6 and at least a portion of said solder pad.
- 1 22. The method of claim 21, wherein said bump feature is provided by a method
2 comprising:
3 providing one or more solder-coated articles comprising: (a) a dielectric core,
4 (b) a solderable metal layer over said core, and (c) a solder layer over said metal layer;
5 placing said one or more solder-coated articles on said one or more solder pads;
6 and
7 applying sufficient heat to melt said solder layer.
- 1 23. The method of claim 21, wherein said dielectric core is a spherical dielectric core
2 and wherein said one or more solder-coated articles are placed on said one or more
3 solder pads by a method comprising:
4 providing a pick-up assembly comprising a block with one or more holes in
5 communication with a vacuum, said one or more holes arranged in a configuration that
6 corresponds to positions of said one or more solder pads;

- 1 placing said pick-up assembly into contact with a group of said solder-coated
 - 2 articles;
 - 3 applying a vacuum such that each of said one or more holes is filled with a
 - 4 solder-coated article;
 - 5 aligning said one or more solder-coated articles with said one or more solder
 - 6 pads; and
 - 7 discontinuing said vacuum such that said one or more solder-coated articles are
 - 8 released on said one or more solder pads.

10